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# **From Waste to Resource Management: Reinventing Waste Contracts and Services**

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**“THERE ARE NO WASTE STREAMS, ONLY WASTED RESOURCES”**

— Raj Mishra, General Motors Corporation, 1999

## **Introduction**

Resource management (RM) is a strategic alternative to disposal contracting and emphasizes cost-effective resource efficiency through prevention, recycling, and recovery in addition to environmentally sound hauling and disposal. RM is based on the idea that contractors will pursue resource efficiency when offered proper financial incentives. RM contracts align waste generator and contractor incentives by constraining disposal compensation and providing opportunities for both the contractor and the generator to profit from resource efficiency innovations. Thus, if contractors identify cost-effective recycling markets for disposed materials, or techniques for preventing waste altogether, they receive a portion of the savings resulting from the innovation. This arrangement enhances recovery of readily recyclable materials such as corrugated cardboard and wood pallets while promoting market development opportunities for difficult-to-recover materials such as paint sludge and solvents.

The General Motors Corporation (GM) coined the term “resource management” as a logical outgrowth of its success with a similar performance-based contracting system in the area of chemical purchasing, use, and management.<sup>1</sup> GM adopted RM in response to an internal corporate waste reduction goal and the recognition that existing hauling and disposal contracts produced limited and uncoordinated resource efficiency across its more than 70 North American facilities. GM’s objective in executing RM contracts was to “provide a systems approach to resource efficiency that motivates cost reduction and conservation of plant resources.”<sup>2</sup> One year after implementing RM contracts at several of its North American plants, GM realized a 20 percent reduction in overall waste generation (30,000 tons), a 65 percent increase in recycling (from 50,000 tons to over 82,000 tons), and a 15 to 30 percent decrease in waste management costs.<sup>3</sup>

A number of diverse organizations are adopting similar best management contracting practices. These include municipalities such as the city of Omaha, Nebraska, corporations such as Kinko’s and Ford Motor Company, and institutions such as the West Des Moines School District. Clearly RM contracting is not limited to large companies such as GM.<sup>4</sup> What’s more, a growing number of contractors, including traditional solid waste and recycling companies, industrial cleaning companies, and consultants are beginning to actively market and offer profitable services similar to RM.

Although RM shows great promise, many basic questions must be addressed for the concept to take hold. What is RM contracting? How is RM implemented? How does RM benefit waste generators? How does RM benefit waste contractors? This paper addressed these questions as a starting point for discussing and advancing RM practices among more than 1,000 organizations participating in the U.S. Environmental Protection Agency’s (EPA’s) WasteWise program. In many respects, WasteWise partners are uniquely positioned to address and benefit from the answers to these questions. This is true not only because WasteWise consists of a large and diverse consortium of organizations devoted to resource efficiency, but also because most

WasteWise partners rely on disposal contracts, and some have undoubtedly developed and used contracting practices similar to RM.

## What is RM Contracting?

RM contracting provides a profit incentive for contractors to identify resource efficiency opportunities and implement innovations that are mutually beneficial for themselves, their customers, and the environment. Consequently, the basic features of RM contracts and resulting services are fundamentally different from those of traditional hauling and disposal contracts in several key areas (Table 1). RM contracts might cap garbage hauling and disposal compensation, for example, and include a profit-sharing arrangement for waste minimization innovations initiated by the contractor. In this way, the impetus for the contractor shifts from increasing disposal volumes to improving resource efficiency at the customer facility.

**Table 1: Distinguishing Features of Waste Hauling/Disposal vs. RM Contracts**

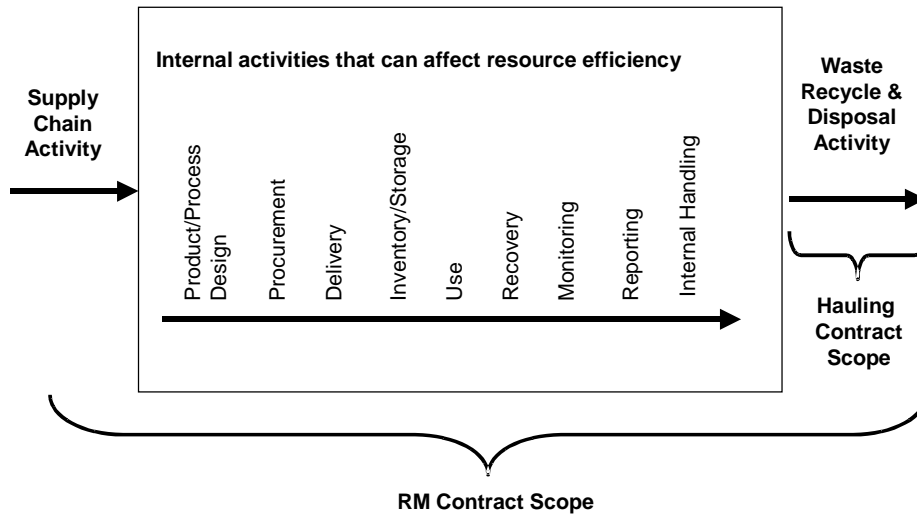
Features	Traditional Hauling and Disposal Contracts	RM Contracts
Contractor Compensation	Unit price based on waste volume or number of pick-ups.	Capped fee for waste hauling/disposal service. Performance bonuses (or liquidated damages) based on value of resource efficiency savings.
Incentive Structure	Contractor has a profit incentive to maximize waste service and volume.	Contractor seeks profitable resource efficiency innovation.
Waste Generator-Contractor Relationship	Minimal generator-contractor interface.	Strategic alliance: waste generator and contractor work together to derive value from resource efficiency.
Scope of Service	Container rental and maintenance, hauling, and disposal or processing. Contractor responsibilities begin at the Dumpster and end at landfill or processing site.	Services addressed in traditional hauling and disposal contracts plus services that inform and influence waste generation (i.e., product/process design, material purchase, internal storage, material use, material handling, data management, reporting).

RM transforms interaction between waste generators and their contractors because the RM contractor must interface with a broader range of stakeholders who are capable of influencing waste generation, such as custodial staff, environmental engineers, purchasers, process and design engineers, and other contractors. Thus, the relationship between the generator and the RM contractor is more like a strategic alliance in which the generator relies on the core competence of the RM contractor to identify and implement resource efficiency innovations.

A RM contractor might address both external waste management activities and internal activities that affect waste generation (Figure 1). Initially, the scope of a RM contract might focus on optimizing external handling, monitoring/reporting, or recovery services (i.e., the “waste recycle and disposal activities” shown at the far right of Figure 1). However, the longer RM contracting is in place, the greater the profit incentive for the RM contractor to create resource efficiency strategies that will influence internal activities. Thus, in more advanced forms, RM can lead to

more efficient material use, storage, and ordering; reduced purchase costs; or ultimately more resource-efficient product or process design.

**Figure 1: RM vs. Hauling Contract Scope in a Typical Industrial Setting**



Although the internal activities depicted in Figure 1 vary from organization to organization, a similarly comprehensive RM scope applies in non-industrial settings as well. In public institutions and/or small businesses, for example, RM contractors might work closely with internal janitorial and administrative staff to optimize resource efficiency. In municipal residential settings, a RM contractor might assume a more active role in public education and outreach to foster increased participation in recycling. Regardless of the organization type or source of resource efficiency, the generator and RM contractor share the savings.

## How is RM Implemented?

Table 2 identifies six standard practices for preparing and implementing a RM contract. Organizations that rely on disposal contracts might find that they have some combination of these practices in place already. The practices in Table 2 are consistent in each application because they align generator and contractor incentives for resource efficiency by establishing a compensation mechanism based on continuous service improvement. Although the practices are somewhat interrelated, the first practice provides the foundation for implementing practices two through six.

**Table 2: Summary of Standard RM Practices**

<b>RM PRACTICE</b>	<b>DESCRIPTION</b>
1. Establish Baseline Cost, Performance, and Service Levels	<ul style="list-style-type: none"> <li>◆ Define current scope and service levels.</li> <li>◆ Identify existing contract and compensation methods.</li> <li>◆ Establish goals.</li> <li>◆ Establish future cost and performance benchmarks.</li> </ul>
2. Seek Strategic Input From Contractors	<ul style="list-style-type: none"> <li>◆ Convene pre-bid meetings with contractors to articulate goals and address questions.</li> <li>◆ Allow or require bidders to submit operations plans for achieving specified improvements in existing operations.</li> </ul>
3. Align Waste and Resource Efficiency Services	<ul style="list-style-type: none"> <li>◆ Coordinate, integrate, and formalize all contracts and services included in the baseline scope identified in Practice 1.</li> <li>◆ Ensure that contractor has access to “internal” stakeholders that influence waste management and generation.</li> </ul>
4. Establish Transparent Pricing for Services	<ul style="list-style-type: none"> <li>◆ Delineate pricing information to specific services such as container maintenance, container rental, hauling, disposal, etc.</li> <li>◆ Allow variable price savings, such as “avoided hauling and disposal” to flow back to generator and/or be used as means for financing performance bonuses.</li> </ul>
5. Provide Direct Financial Incentives for Resource Efficiency	<ul style="list-style-type: none"> <li>◆ Establish compensation that allows contractor to realize financial benefits for service improvements and innovations.</li> <li>◆ Assess liquidated damages for failing to achieve minimum performance benchmarks or standards.</li> </ul>
6. Cap Compensation for Garbage Service	<ul style="list-style-type: none"> <li>◆ Establish a cap on waste hauling/disposal service compensation that decreases gradually over time.</li> <li>◆ De-couple contractor profitability from waste generation and/or service levels.</li> <li>◆ Based initially on reasonable estimates of current hauling and disposal service and costs as per practice 1.</li> </ul>

## **How Does RM Benefit Waste Generators?**

Although demand for RM service is far from widespread, generating organizations are beginning to recognize that RM contracting is fairly easy to implement and that it produces many short- and long-term benefits, such as reduced administrative, material handling, processing, and disposal costs; more focused and coordinated resource efficiency; and improved data tracking and information systems. The real selling point of RM might be its potential to produce tangible service enhancement and added value without increasing net contract costs as shown in Table 3, which is based on RM research in Nebraska and Iowa.<sup>5</sup>

**Table 3: RM Potential at Select Organizations**

<b>ConAgra:</b> RM contracting would quadruple recycling, produce a 25 percent reduction in the ConAgra Corporate Campus' disposal volumes at a net savings equivalent to one-quarter of the current hauling and disposal contract value.
<b>Metro Community College:</b> At this small community college, RM contracting has been projected to increase recycling 14-fold (from 31 tons to 442 tons) and produce disposal savings and recycled commodity value of about \$19,500, equivalent to nearly two-thirds of current disposal contract value.
<b>Omaha Public Power District (OPPD):</b> RM would facilitate replication of a successful OPPD facility recycling program, which has achieved a 50 percent decrease in disposal volume, to all 22 OPPD facilities throughout eastern Nebraska.
<b>Omaha Public Works Department (OPWD):</b> OPWD executes multiple hauling, disposal, composting, and recycling contracts on behalf of 121,000 residential accounts. RM would establish a recycling performance benchmark, grant financial bonuses in excess of the benchmark, and levy liquidated damages if the benchmark is not achieved. It has been projected that such actions would result in a 50 percent increase in recycling (10,000 tons/year) and an 11 percent decrease in disposal, while slightly decreasing overall contract costs.
<b>West Des Moines Public School District:</b> The district adoption of RM at its 18 public primary and secondary schools would reduce its disposal stream, contracted disposal costs, and internal administrative costs. A pilot study showed that between 25 to 50 percent of waste in the district could be diverted—nearly 800 tons per year.

Table 4 shows how RM contracting affected service levels at one of the first GM plants to execute aRM contract. In addition to a 30 percent cost reduction, the plant received substantial service improvements, including: two full-time, on-site RM managers; various recycling programs targeting materials such as corrugated cardboard, pallets, light bulbs, grinding swarf, and fly ash; enhanced environmental reports and tracking, which GM uses in support of ISO 14001 certification; and a variety of other service benefits.

**Table 4: RM Service Enhancements at the General Motors Orion Assembly Facility, Orion, MI<sup>6</sup>**

Services Before RM: Nine Contracts	Services After RM: One Contract
<ul style="list-style-type: none"> <li>◆ Hauling (2 contracts)</li> <li>◆ Disposal (4 contracts)</li> <li>◆ Consulting studies (1 contract)</li> <li>◆ Waste Pad Assistance (1 contract)</li> <li>◆ Sludge Clean Out (1 contract)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Hauling</li> <li>◆ Disposal</li> <li>◆ Waste Pad Management</li> <li>◆ Comprehensive Studies</li> <li>◆ Two On-Site RM Managers*</li> <li>◆ Off-Site Support*</li> <li>◆ Comprehensive Recycling*</li> <li>◆ Environmental Reports*</li> <li>◆ Waste Tracking Systems*</li> <li>◆ Staff Training*</li> </ul> <p>* = New Service</p>

Despite the benefits shown in Tables 3 and 4, lack of widespread demand for RM can be attributed in large part to the fact that hauling and disposal costs tend to be small—typically less than 1 percent—compared to other organizational costs. As a result, organizations logically focus their efforts and resources on reducing larger operating costs and developing competencies in areas fundamental to their core business activity. Although the actual cost savings from avoided disposal and commodity revenue might be small relative to total generator operating expenses, the additional services and corresponding “soft” savings that are often not captured, such as reduced personnel time and reporting effort, help make the business case for RM.

## **How Does RM Benefit Waste Contractors?**

At least three categories of companies are beginning to provide services similar to RM to a small number of generators.

- ◆ The \$57-billion-a-year disposal industry, including companies such as Waste Management, Environmental Quality Services, and Heritage, are beginning to offer RM-like services in response to demands from large generators such as GM. Depending on how the RM model proliferates, other traditional hauling and disposal companies might be forced to weigh in on the issue and develop their own RM capacity, or risk a rapidly diminishing service base.
- ◆ The second category includes companies with specialized expertise in internal waste or process management and/or resource efficiency. These include janitorial service firms, industrial cleaning companies, property management companies, and consultants.<sup>7</sup>
- ◆ The third category includes “waste brokers,” a rapidly growing segment of the solid waste industry that provides hauling and disposal contract management services for national companies. Brokers currently rely primarily on a business model that produces value by aggregating contracts, achieving economies of scale, and reducing administrative and hauling expenses. As might be the case for traditional service providers, brokers might see RM service as a means of diversifying their profit base.

Although hauling and disposal contract costs, and thus savings, tend to be small compared to other expenses for a waste generator, such costs represent substantial increases in contract value for a RM contractor. Research sponsored by the Nebraska Environmental Trust suggests that RM contracts substantially increase total contract revenue potential (Table 5).

**Table 5: RM Impact on Contract Value for  
Select Nebraska Organizations<sup>8</sup>**

	<b>Omaha Public Works</b>	<b>Metro Community College</b>	<b>ConAgra</b>
Est. Additional Tons Recycled—"Cost Effective RM Tonnage"	10,000	442	572
Percent Increase in Recycling	50%	1,426%	418%
Baseline Contract Value	\$2,448,803	\$28,550	\$57,178
RM Savings—"Profit Sharing Potential"	\$180,351	\$19,466	\$15,134
Maximum RM Contract Value	\$2,629,154	\$48,016	\$72,312
RM Savings as a Percentage of Baseline Contract Value	7%	68%	26%

Clearly there will be a point of diminishing returns for RM contractors, but there is substantial “low hanging fruit” that will allow contractors to profit from RM in the near term. As RM evolves, contractors are likely to pursue both market development for recyclable materials that are more difficult to recover and additional resource efficiency opportunities from improvements to other internal processes. RM contractors can anticipate other benefits, including the ability to distinguish themselves in a consolidating and increasingly competitive market. Public hauling and disposal companies, for example, are under pressure from Wall Street to increase cash on hand in order to reestablish investor confidence.<sup>9</sup> Diversifying their revenue stream with RM services is therefore an attractive area for growth because it involves little capital investment. Finally, the type of generator/contractor relationship inherent in RM provides the opportunity to facilitate more strategic partnerships with generators in which the focus on the contractor shifts from a cost focus to a value-added service focus. This facilitates the contractor’s ability to offer additional environmental services while ensuring longer-term customer retention.

Notwithstanding these potential benefits, several hurdles must be overcome to produce a visible and practicable RM service industry. Reducing disposal volume poses an obvious conflict for a hauling or disposal company that profits through disposal volume sales. Furthermore, the skills required to provide RM service are inherently different from those required for providing hauling and disposal service. Traditional solid waste and recycling service contractors could develop the required expertise to provide RM services, but profit incentives for most existing contracts prevent them from taking this step.

RM holds the promise of transforming the waste management industry by changing how waste-related companies define the value of their services and the way they generate profit. Supplying RM services is by no means an opportunity limited to traditional waste management companies.



Because RM requires a broader array of information-intensive management services, there are several other classes of companies potentially capable of filling the role, including engineering firms, management consultants, or property management groups. Initial indications suggest that RM can be highly profitable for contractors, whatever their current make-up or designation.

## **Conclusions**

In 1997, approximately 100 million tons of waste discarded in the United States was managed through contractual relationships.<sup>10</sup> Experience to date suggests that up to half of these contracted discards (50 million tons) could be eliminated through RM contracting as a combined result of enhanced recovery of readily recyclable waste streams, recycled commodity market development, and source reduction. This would lead to a national diversion rate of 51 percent, well in excess of EPA's national goal. If half of the "contracted" paper discard stream alone were recovered (12 million tons) as a result of RM, the United States would avoid more greenhouse gas (GHG) emissions than are avoided by the entire WasteWise program (9 million MTCE versus 7 million MTCE). WasteWise recycling could grow by as much as 65 percent (4.5 million tons) with a corresponding increase in GHG reductions of 1 million MTCE, if WasteWise members achieve results similar to those achieved by GM—a WasteWise partner since 1994. As a result, there is a need to identify and evaluate policy instruments in the form of tax incentives, depreciation allowances, and outreach/education that might fuel the RM market from both a contractor and generator perspective.

Research to date demonstrates that RM is widely applicable in business, institutional, and municipal settings, but many important questions remain. How large is the RM market? In what settings is it most appropriate and what are its limitations? What tools, case studies, and model contracts will best accelerate RM adoption? These and other questions are being explored in ongoing efforts to promote and advance best management RM contracting practices within WasteWise organizations.

## References

<sup>1</sup> GM has been practicing chemical management for more than 15 years. For more information on chemical management services, see <[www.chemicalstrategies.org](http://www.chemicalstrategies.org)>.

<sup>2</sup> Underwood, Warren, 2000. General Motors Corporation Worldwide Facilities Group. Adopted from a presentation at the 2000 National Recycling Congress, Charlotte, NC, entitled: “Resource Management.”

<sup>3</sup> The variance in cost reduction can be attributed to the fact that some facilities were further along in their source reduction and recycling programs, and therefore had less opportunity to make quick gains.

<sup>4</sup> Ongoing Tellus research projects include: *Advancing Resource Management Contracting in Nebraska*, a public-private partnership sponsored by the Nebraska Environmental Trust, partners: Nebraska State Recycling Association, ConAgra, Inc., Omaha Public Power District, Omaha Public Works Department, and Metro Community College. *Resource Management Bid Assistance to the West Des Moines School District*, sponsored by the Iowa Waste Management Assistance Division. *Achieving Cost Effective Diversion through Resource Management Contracting*, sponsored by the Missouri Department of Natural Resources, partners: General Motors, Harley Davidson, Jackson County.

<sup>5</sup> See reference 3.

<sup>6</sup> Underwood, Warren, 2000. See reference 1.

<sup>7</sup> Based on a “RM Supplier Forum” convened for *Advancing Resource Management Contracting in Nebraska*, October 3, 2000.

<sup>8</sup> See reference 3.

<sup>9</sup> Based on the following investor reports for the solid waste industry: 1) Pavese, Alan. Greenline: An Environmental Services Quarterly. *Cash is King*. Credit Suisse First Boston Corporation, Boston, MA. March 20, 2000. 2) Gray and Coltman. Environmental Quarterly. *Returning Interest Cleaning Up Stocks*. Deutsche Bank, Chicago, IL. August 2000.

<sup>10</sup> Assumes two-thirds of the 1997 U.S. waste stream reported in EPA’s *Characterization of Municipal Solid Waste: 1998 Update*.